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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/808,684	03/15/2001	Dieter Schulz	50626.19	5285

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KEATING & BENNETT, LLP
10400 EATON PLACE
SUITE 312
FAIRFAX, VA 22030

EXAMINER

JAMAL, ALEXANDER

ART UNIT	PAPER NUMBER
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2643

DATE MAILED: 05/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/808,684

Applicant(s)

SCHULZ, DIETER

Examiner

Alexander Jamal

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 1-4 and 8-10 is/are allowed.
- 6) ☒ Claim(s) 5-7 and 11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Examiner notes that no claims have been amended by applicant. Arguments concerning the rejection of claims 5-7 and 11 have been submitted by applicant.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 5,7** rejected under 35 U.S.C. 103(a) as being unpatentable over Xie et al. (5644634), and further in view of Timm (4231103).

As per **claim 5**, Xie discloses a multi-frequency tone detector comprising an analysis filter 124 (Fig. 2) for detecting tone energies at multiple frequencies (Col 7 line 1-16). Xie further discloses a decision logic block to detect tone frequencies based upon the detected energy (Col 7 lines 32-45). By allowing different window sizes for each bin, the window size is chosen to be the most accurate for each bin (Col 9 lines 5-36), and each window is centered on the desired frequency (Col 11 lines 25-50). However, Xie does not specify aligning the spectral nulls of the filter response with any tones with frequencies adjacent to the tone being detected.

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Timm teaches that in spectral analysis with adaptive windows, the filter response has a null at frequencies F_m (Col 1 line 46 to Col 2 line 45). Timm further teaches that leakage may occur (inaccurate detection) if the input signal contains signals with frequency components other than F_m . It would have been obvious to one of ordinary skill in the art at the time of this application that Xie could align the spectral nulls of the filter response to fall on any signals adjacent to the signal being detected for the advantage of further reducing any spectral leakage and increasing detection accuracy.

As per **claim 7**, Xie's analysis filter is a digital filter (Col 3 lines 25-31).

4. **Claims 6,11** rejected under 35 U.S.C. 103(a) as being unpatentable over Xie et al. (5644634) and Timm (4231103) as applied to claim 5 above, and further in view of Felder et al. (6370244).

As per **claim 6**, Xie and Timm disclose applicant's claim 5, however Xie does not mention using a rectangular window for the analysis filter.

Felder teaches a DTMF detector implementing an analysis filter with a rectangular window with variable window size to detect energy in each frequency bin (Col 7 line 66 to Col 8 line 17). It would have been obvious to one of ordinary skill in the art at the time of this application to use a rectangular window in the analysis filter for the purpose of reducing the complexity of the system (Col 8 lines 11-14) while maintaining it's functionality.

As per **claim 11**, Xie's analysis filter is a digital filter (Col 3 lines 25-31).

Response to Arguments

5. Applicant's arguments filed 2-2-2005 have been fully considered but they are not persuasive.

As per applicant's arguments that the Xie and Timm references do not disclose positioning spectral nulls of a filter response at the tone detected frequencies adjacent to the frequency of interest (remarks pages 6-7), examiner contends that Xie in view of Timm would have obviously made that step as a matter of design choice based on the fundamental properties of both the window frequency response and concept of signal leakage as applied to a tone detection system. The primary goal in Xie is to modify the size of the window used in the tone detection system in order to increase the detection accuracy (XIE: ABSTRACT) by reducing possible leakage. Xie contemplates the leakage as an error source and provides one way of reducing leakage by centering the window frequency response (Xie: Col 11 lines 25-50) in order to reduce the effects of frequency distortion (an offset in frequency) that would cause leakage and could lead to false detections.

Timm teaches that an FFT process with a window comprises a frequency response with nulls at certain frequencies (Cool 2 lines 5-25). A null will provide a zero response at that frequency. The DTMF system disclosed by Xie consists of a set of tone frequencies. Because tones adjacent to the desired tone will be the greatest known source of noise (in the form of possible leakage into the desired tone frequency bin), examiner

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contends that it would have been obvious that the spectral nulls taught by Timm could be used to help nullify the leakage effect of adjacent tones. Xie already discloses an object of his invention is to reduce leakage by varying the window size (which is essentially varying the frequency response of the filter) in order to increase detection accuracy. The concept of nulls provided by Timm provides another way to minimize the leakage. Xie's method minimizes the leakage from tone frequency distortion, and the concept of frequency nulls provides a way to minimize the leakage from adjacent frequencies (which are KNOWN sources of noise to the desired tone in a DTMF system).

Allowable Subject Matter

6. **Claims 1-4,8-10** are allowed over the prior art of record

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Jamal whose telephone number is 571-272-7498. The examiner can normally be reached on M-F 9AM-6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis A Kuntz can be reached on 571-272-7499. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and 703-872-9315 for After Final communications.

AJ
May 18, 2005


CURTIS KUNTZ
TECHNICAL PATENT EXAMINER
TECHNOLOGY CENTER 2600